L-EGS 11 EGS Science Data System Performance Test-LDAAC

Overview

This test verifies the system-level performance of the EGS Science Data System in an operational environment at LDAAC. The operational activities consist of the following:

- Ingest and archive Level 0 PDS data from MISR, MOPITT and CERES instruments of AM1.
- Ingest and archive L0 Expedited Data Sets (EDS) from MISR, and MOPITT and CERES instruments
- Ingest and archival of S/C ancillary data and attitude and orbit data from GDAAC for product generation
- Transmit MOPITT L0 data and ancillary data to MOPITT SCF
- Ingest MOPITT data products from MOPITT SCF
- Generation and archival of higher level data products from MISR
- ECS to LDAAC V0 interoperability
- Data access
- Data distribution

For this test, the system will be configured to operate in "a day in the life of a DAAC" scenario, with normal daily operations ("Normal Operations" based on the Science Operations Rehearsal Scenarios, and Release 2.0 capabilities, Drop 4P).

No functional requirements are verified in this test, as they will have been verified in the system/subsystem/interface tests that precede this test.

Scope[1]

The aim of the test is:

- to verify EGS Science Data System performance when the ingest of all data streams, product generation, archival, data access and distribution activities are being carried out concurrently, according to the normal daily operations schedule of the DAAC
- to verify the timely availability of archived data to the network, for data distribution under specified conditions.

Details of the test cases and test procedures for the DAAC are given in the following sections.

[1] A clear definition of the performance capabilities for Drop 4P is not available. The scope of the performance testing is provisional and uses the ECS performance Targets for the System at the time of Launch of AM1, as presented by Raytheon on 26 May, 1998.

Test Objectives:

Test Case 1: Daily science operations performance verification test

This test case verifies the performance of user data access, and data distribution, when the system is operational with concurrent ingest and archival of MISR and MOPITT, and CERES L0 data , ancillary data, generation of MISR products and their archival; Transmission of MOPITT L0 data to MOPITT SCF, ingest and archival of MOPITT products from MOPITT SCF, according to the daily operations plan. Performance of the following are verified:

- Science data products generation
- Data access
- Data distribution

Test Case 2: Timely availability of archived data to the network, to verify the performance capabilities for data distribution under specified conditions.

Success criteria used for performance verification are derived from the following requirements[2] (Provisional) and the "at Launch" ECS performance targets. Details of the requirements are given in Attachment-X and the identified ECS performance targets are given in the test package.

DADS1235#B, DADS2778#B, DADS3100#B, DADS3110#B, DADS3125#B, DADS3126#B, DADS3135#B, EOSD1015#B, EOSD1030#B, EOSD1050#B, EOSD1060#B, EOSD1070#B, (EOSD1080#B)[3], IMS-1780#B, (IMS-1785#B).

[2] A clear definition of the performance capabilities for Drop 4 is not available. The scope of the performance testing is provisional and uses the ECS performance Targets for the System at the time of Launch of AM1, as presented by Raytheon on 26 May, 1998.

[3] Requirements in parenthesis are not being tested now as they are outside the scope of Release 2.0.

Test Configuration:

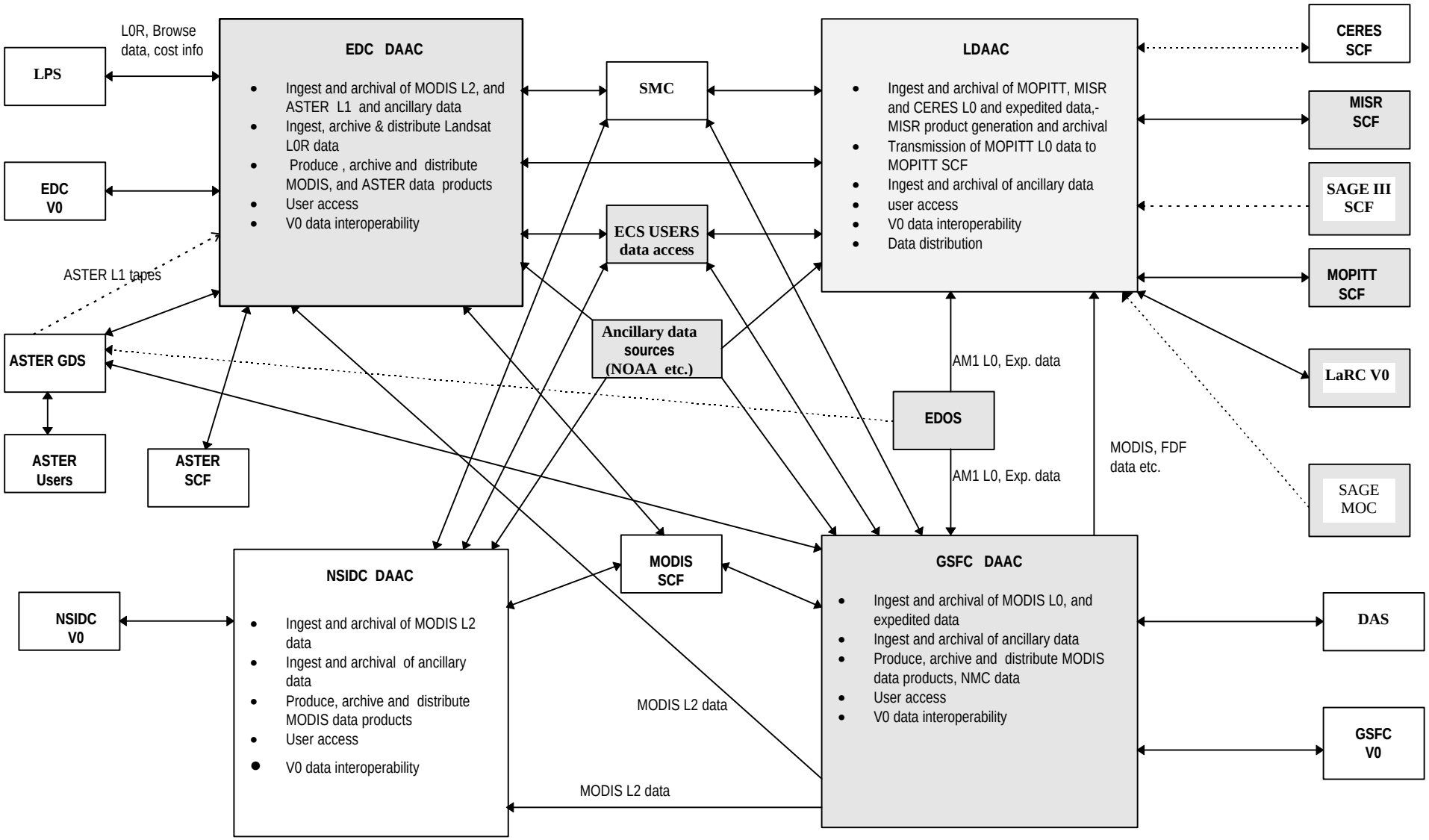

Exhibit 1: Test Configuration and Data Flow- LaRC (Shaded)

Participants and Support Requirements:

Participants:

EDOS Operations personnel

LDAAC M&O personnel

EGS I&T Test Coordinator

GDAAC

MOPITT SCF

MISR SCF

LaRC V0

Communications:

Voice: All operational circuits

Data: All operational circuits

Equipment and Hardware:

Hardware: TBD

Software: TBD

Test Tools: TBD

Test Data: The test data requirements are given in Table - 1

Description/ Characteristics	Source	File/Script Name - Physical loc.
Test Case 01		
MOPITT L0 data, multiple files, orbit and attitude information	EDOS FDF/GSFC	
MISR L0 data, multiple files orbit and attitude information	EDOS FDF/GSFC	
CERES L0 data	EDOS	
MOPITT L 1/L2 Products	MOPITT SCF	
MOPITT, and MISR expedited data	EDOS	
Test Case 02		
Data sets kept on line for rapid retrieval	TBD	

Table - 1 Test data for daily science operations performance verifications test

Test Case Descriptions

EGS 11.01 : Daily science operations performance verification test

Requirements: (provisional)

DADS1235#B, DADS2778#B, DADS3100#B, DADS3110#B, DADS3135#B, EOSD1015, EOSD1030#B, EOSD1050#B, EOSD1060#B, EOSD1070#B, IMS-1780#B.

Test Configuration: LDAAC will be configured for the daily operational activities based on the science operations plan and the technical baseline. All hardware, software, and PGEs allocated to this release and as integrated into the system are operational and the operations are supported by the M&O personnel. LDAAC is scheduled to receive CERES, MISR, and MOPITT L0 and expedited data from EDOS. LDAAC is also configured to receive ancillary data as required for product generation from the designated sources. LDAAC will generate and archive higher level data products for and MISR. LDAAC will transmit MOPITT L0 data to MOPITT SCF and ingest and archive MOPITT products from MOPITT SCF. Test data files for use in data access, browse, and data distribution are made available on the ECS archives at the LDAAC and V0 IMS at Langley is available to the LDAAC ECS user access. For performance testing of user access/data distribution functions, two or three user terminals, are provided with operations personnel.

Test Execution: The DAAC will be operational in the configuration briefly described above and all the scheduled daily operations will be running during the complete duration of all the test cases identified for this test. Procedures for this test case are written in two parts, test case 1A and test case 1B. The test case 1A will be executed over a period of 3 days to verify the generation of higher level products and test case 1B will be run for 12 hours on each day, for verifying the performance of user data access and data distribution. The test is aimed at verifying the performance requirements rather than functional requirements, which are verified in EGS 10 and earlier tests. However, any failures or errors in the operational functions will be recorded for appropriate actions. Test cases 1A and 1B, described below will be performed concurrently.

Test case 1 A

Ingest, data products generation, and archival: This test verifies that L0 data are ingested and higher-level products are generated for MISR, within the specified performance limits and are archived. MOPITT L0 data will be sent to MOPITT SCF for Product generation at the SCF. MOPITT higher level products are received and archived at LDAAC. Details of the ingest, product generation and archival volumes at the DAAC are given in the Table below: (needs update/completion).

Ingest and Archive	Data Received from	Volume/day GB/day	Product generation and Archive	Volume/day (TBD)
MISR L0 MOPITT L0 CERES L0 MOPITT Products	EDOS EDOS EDOS MOPITT SCF	~45 GB/day <1GB/ day < 1 GB/day < 1 GB/ day	MISR[4] Products --	L1 184 GB / day
CERES, MISR, and MOPITT L0 Expedited data	EDOS	<1 GB/day	--	

Table 2 : Details of data Ingest and Products Archived

Test Procedures: The Test procedures may be seen in Attachment 1A.

Test Case 1 B

Data access : This part of the test case verifies performance of user access, search browse and data distribution. Details of data access activities, performance requirements as specified in the F&PRS and the corresponding ECS "at launch" targets are given in Table 3 below:

No	Activity	Requirement F&PRS	ECS Launch Target
1	• User log on and authorization	13	?

2	• Directory Search
	  • by single key word
	  • by multiple key word and time or space range check
		8
		13
			2
			8

3	• Guide Search, Search for document by key word	8	NA

4	• Inventory Search
	  • Search one instrument by multiple key word attributes with time or space range check
	  • Search multiple instruments by multiple keyword attributes with time or range check (1 DAAC)
		8
		18
			30 sec
			2 min 20 sec.

5	• Status Check
	  • Status check (order)
	  • Account status
		13
		13
			?
			?

[4] MISR Products: PGE01, Science data product and PGE02 to PGE07 Engineering and calibration products

No	Activity	Requirement F&PRS	ECS Launch Target
6	• Browse: • Retrieve and begin to display standard pre-computed browse product	58	25 sec.

7	• Ordering Services:
	  • Local DAAC order submission and confirmation
	  • Cost estimates(Capability may not be available at Launch)
		13
		13
			20 sec.
			NA

Table 3 User access performance details

Number of user accesses for each DAAC: The performance specifications refer to the total number of accesses for the ECS. An estimate of the number of accesses for each DAAC is derived using available information on the user access patterns for different DAACs reported in the "Technical Baseline"(Feb.'96), and is as follows:

EDC 34%

GSFC 17%

LaRC 8%

NSIDC 6%

(ASF11% and JPL 23%)

Using the above information, an effort is made to determine the total number of service invocations at each DAAC for conducting the performance test, and is given in Table 4

Service	**No of operations/hr in ECS**	**No of operations/hr at LDAAC**	**Specific operation**	**Response time requirement (sec)**	ECS Launch Target
Log-on and authorization	100	8	Authorization	13	?
Directory search	80	6	single keyword	8	2
			multiple keyword	13	8
Guide search	40	3	doc search by keyword	8	NA
Inventory search	120	10	One inst	8	30 sec
			Multi-inst	18	2 min 20 sec
Status check	60	5	Status of Order/DAR	13	?
			Account status	13	?
Browse	50	4	Begin display	58	25 sec
Ordering	25	2	Local DAAC	13	20 sec
services			Cost estimate	13	NA

Table4 Estimated Service Invocations at LDAAC

Data distribution: This part of the test verifies the performance of the following:

- Product orders: The test will verify that the DAAC can distribute twice the volume of products archived on any day, which includes L0 archive, L1 to L4 products archived. An estimate of the data volumes expected to be archived is made using the L0 data estimates from the Technical Baseline, L1 to L3 archival volumes at launch, from F&PRS,

Estimated Data Archival at DAAC (Provisional)

DAAC	L0 Data Archive[1] GB/day	Product Archive[1] GB/Day	Total GB/Day
LDAAC	~47	185	232

[1] From ECS Performance Targets 26 May 1998

- The test consists of the following steps:
    - Using the total volume of data archived as 232 GB per day, the total volume of data to be distributed from the DAAC for electronic and for media distribution during the 24 hour period of the test is determined to be 464 GB
    - Generate a large number of product orders, with
        - 232 GB of data for distribution is on hard media.
        - 232 GB of data for distribution over the network
    - Volume limits of any single order is TBD, if required.
    - Determine the time for the completion of data delivery for each order.
    - Determine the total amount of data distributed electronically and by media every hour, 3 hr., etc. to determine the average rate of distribution.
    - The average rate of distribution for both electronic and media distribution should be 9.66 GB/ hour, over the 12 hour test period.

Test Procedures: The test procedures may be seen in Attachment 1B

EGS 11 02 : Timely availability of archived data to network

Requirements: (provisional)

DADS3125#B, DADS3126#B

This test verifies the capability of ECS at LDAAC (operating under normal conditions) to:

- deliver data archived on tape to the communications network, in response to data requests, within 5 minutes. This time is from the time of reception of order by the DAAC to the time the data is retrieved and given to the network for onward transmission to the user electronically. (by this, all delay in the communication lines, on which ECS have no control are excluded. Please see DADS3125 for more details along with conditions under which the test is to be conducted.)
- deliver data sets available for rapid retrieval (kept on line) within 60 sec. after receipt of the data order. (DADS3126 specifies the volume of the data to be delivered and the number of data requests to be satisfied in parallel for each DAAC).

Test Procedures: The test procedures may be seen in Attachment 2

Attachment 1A

Test Case Id: V2.0-L-EGS-11-01-A

Description: This test verifies that:
1. LDAAC ingests and archives CERES, MISR, MOPITT L0 and expedited data from EDOS and generates MISR, higher-level products within the specified performance limits.
2. Transmit MOPITT L0 data to MOPITT SCF.
3. Ingest and archive MOPITT Products from SCF
4. Ingest and archive S/C Ancillary data from GDAAC (DAAC to DAAC Interfaces TBD)

The test case will be run for 3 days.

Objectives: Verify ingest and archival of CERES, MISR, MOPITT L0 and expedited data, and MOPITT higher level products from MOPITT SCF, generation of higher level products from and MISR, within the specified time limits.

Configuration: LDAAC will be configured for the daily operational activities based on the science operations plan and the technical baseline. All hardware, software, and PGEs as integrated in to the system are operational and the operations are supported by the M&O personnel. The LDAAC is configured to receive CERES, MISR, and MOPITT L0 and expedited data from EDOS. LDAAC is configured to receive the ancillary data as required for MISR and MOPITT product generation from the designated sources. The DAAC will be configured to operate on the normal daily operational schedule. This test case will run concurrently with test case 1B at this DAAC.

Data Inputs: CERES, MISR and MOPITT L0 and expedited data from EDOS, MOPITT Products from SCF and ancillary data required for higher level product generation.

Verified Requirements: DADS1235#B, DADS2778#B, DADS3100#B, EOSD1015#B EOSD1030#B, EOSD1050#B, EOSD1060#B, EOSD1070#B, .

Test Procedures:

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
1.001	LDAAC	Verify that LDAAC is fully operational with all hardware/ software /interfaces installed and with all PGEs installed and operational.	LDAAC is operational.			
1.002	LDAAC	Verify from EDOS that EDOS is operational and is ready to participate in the test, and CERES, MISR, MOPITT L0, and expedited test data sets to be transmitted to LDAAC are available.	EDOS is operational.			

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
1.003	LDAAC	Verify that all ancillary data and lower level products are available for higher level product generation. Also verify that data for user access/data distribution is available on the ECS archives at the DAAC.	Verified			
2.001	LDAAC	Identify a daily product generation scenario and time lines including all normal operations at the DAAC, and PGEs allocated to the release, based on the information about availability of MISR L0 data from EDOS. Follow procedures out lined in the 611 document, Sections 13.1, 13.2, 13.3.	Daily operations plan is scheduled.	Details of the values to be entered in different GUI screens are to be identified during the initial verification of these procedures.		
2.002	LDAAC	Activate the Ingest Process for ingest by polling for ingest with PDR from EDOS. Procedures as in 611 doc. Section 16.4.1	The ingest polling process starts and ingest is activated whenever EDOS pushes the PDS and EDS s to the polling server.			
2.003	LDAAC	Monitor the Ingest process and verify that MISR, MOPITT (CERES) L0 and L0 expedited data are received and archived at LDAAC, according to schedule/ or as available. Procedures as in 611 Doc. Sections 16.2.2, 16.2.3, 16.2.4, 16.4.3, 16.4.4	L0 and expedited data are received and archived at LDAAC		DADS1235#B, DADS3100#B, EOSD1015#B, EOSD1030#B	
2.004	LDAAC	Verify that PANs / EANs are sent after each successful ingest of the PDS / EDS. From the ingest log find out the time taken for the ingest of each of the PDS files.	PANs and EANs are issued the time for ingest of PDS / EDS should be 15 min. for the first 1 GB of the data + 15 min for every additional GB of data			
2.005	LDAAC	Log on to GDAAC and receive S/C ancillary data and House Keeping data required for MISR and MOPITT data processing. Procedures TBD, after interface details are known	The specified data are received	**Details of the DAAC to DAAC interfaces method of data transfer is TBD**		
2.006	LDAAC	Transfer MOPITT L0 PDS and L0 EDS data, and S/C ancillary and H/K data required by MOPITT SCF. Procedures TBD, after the interface details are known.	The specified data are transmitted to SCF	**Interfaces for the transfer of these data to SCF are TBD**		
2.007	MOPITT SCF	Receive the MOPITT L0 data and other data and acknowledge receipt. Procedures TBD.	Data Received and acknowledgment sent	**Interfaces to SCF are TBD**		

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.008	LDAAC	Verify the receipt of the Ack. From MOPITT SCF for the data sent. Procedures TBD.	Ack. Received from SCF			
Test steps 2.001 to 2.008 are repeated every two hours.						
2.009	LDAAC	To enable production monitoring, configure AutoSys, following the procedures outlined in 611 doc. Sections 14.1 to 14. 11 and Section 14.13.	Production monitoring is active and will be used during the progress of the test.	**The default values are used initially and changes are made during the dry runs of the test as needed.**		
2.010 **a**	LDAAC	On receipt and archival of MISR L0 data from EDOS place the corresponding PDS data suitable for product generation, on the designated server (TBD) for access by the PGE **as the L0 data received from EDOS is not suitable for product generation.**		**Work around**		
2.010	LDAAC	Verify using the Production Monitor capabilities (AutoSys), that following step 2.008a and availability of the L0 data and the required ancillary data (TBD) triggers the execution of the MISR PGEs, and production of level 1 products starts. Please see step 2.007 for production monitoring.	Execution of , MISR, PGEs will start.	This is a general step for any PGE. To be revised, as needed, when the PGEs are identified		
2.011	LDAAC	Monitor progress of product generation (all PGEs), using Autosys. Please see step 2.007 for production monitoring.	Information on the data processing health is continuously monitored.	The monitoring will be continued for all products generated in this test		
2.012	LDAAC	Verify that higher level MISR, products are generated, DAAC QA, and Stored. Procedures as in 611 Doc. Section 15.11	MISR products are generated and stored.	Verified--details to be specified	EOSD2778#B	
2013	MISR SCF	Send an e-mail subscription to LDAAC for the science QA of the MISR products to be generated.	e-mail for QA subscription is sent to LDAAC	Steps 2.011 and 2.012 can be performed any time earlier.		
2.014	LDAAC	On receipt of the e-mail from MISR SCF, generate a subscription for the QA of the products generated for the MISR SCF Procedures: Use subscription Service tool: detailed procedures TBD. (Pl. see Pages 51 to 60 of 625-CD-013-001)	Subscription generated			
2.015	LDAAC	Verify that When the product subscribed for by the SCF is generated and staged, an e-mail is sent automatically to SCF that the data has been staged	e-mail sent to the SCF			
2.016	MISR SCF	On receipt of the e-mail, SCF pulls the data from the designated directory.	SCF receives the product			
2.017	MISR SCF	SCF conducts Science QA, and update QA Metadata Procedures TBD by the SCF	Science QA is complete.			

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.018	MISR SCF	Communicate the updated QA Metadata to DAAC .	QA update is sent to LDAAC			
2.019	LDAAC	The QA metadata is received and the product QA is updated and products. Archived (Procedure TBD)	Science QA is complete.			
2.020	LDAAC	Verify using Autosys and product archival log that MISR, higher level products are generated in less than 24 hours after the required lower level products and ancillary data are available to the system.	MISR, higher level products are generated in less than 24 hours after the required lower level products and ancillary data are available to the system.		EOSD1050#B, EOSD1060#B, EOSD1070#B,	
Repeat the steps 2.010 a to 2.020 every two hours when the new L0 data is received from EDOS						
2.021	MOPITT SCF	Send MOPITT products generated to LDAAC for archival Procedures TBD by MOPITT SCF	MOPITT generates the higher level products and sends them to LDAAC	The interface for transmission of data to LDAAC is TBD		
2.022	LDAAC	Receive and archive MOPITT products (Procedures TBD)	MOPITT products received and Archived.	Interface details / procedures TBD		
Repeat step 2.021 and 2.021 when ever new MOPITT products are generated						

Attachment 1B

Test Case Id: V2.0-L-EGS-11-01B

Description: This test verifies performance of user access, search, browse, and data distribution at LDAAC.

Objectives: Verify that user access to the system and data access and data distribution are achieved within the specified time limits.

Configuration: The LDAAC is operational and is operating in the "day in the life of DAAC" mode as described in test case 1A. This test case will run concurrently with test case 1A.

Data Inputs: MISR, MOPITT Level L0 and L1 Test data, or similar data for data access test. The system should have a large number (Say 100) of user profiles data base including users who will access the system during the test . For purposes of this test, the test conditions specified in F&PRS section 7.5.3.4 should be fulfilled.

Verified Requirements: DADS3100#B, DADS3110#B, DADS3120#B, DADS3135#B IMS-1780#B.

Test Procedures: (to be updated)

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
1.001	LDAAC	Verify that LDAAC is operational as set up in the test case 1A.	LDAAC is operational as set up in the test case 1 A.			
1.002	LDAAC	Verify that the IMS data base is set up with a large number of user profiles for verification of user authentication, and user access in this test. About log ins /hour (to be discussed).	The IMS user profile data base can support the test.			
1.003	LDAAC	Verify that the test data required for directory search, guide search, inventory search, and science data orders are all available in the ECS data archives.(Details of these data are to be discussed in advance with the DAAC).	All the test data are available in the DAAC archives.			
1.004	LDAAC	Verify that arrangements are complete for simulating the required number of user authentications/hour (8), and user accesses for search, browse and data orders, using multiple user terminals (2 or 3)	All physical and logistic arrangements are made for user access, and data distribution.			

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.001	LDAAC	Generate 8 user authentication requests/hour, at random using the user profiles available in the system and also some un-registered users (guest users) (2) and some. un-authorized users (wrong user name / password) (2). Log the times at which the authentication requests are sent and when the system responses are received.	The system will respond with 8 authentication responses, 6 approvals and 2 rejections. The average response time for authentication response is 8 seconds or less.	Leave all the 6 users remain logged in	DADS3135#B, IMS-1780#B	
2.002	LDAAC	Conduct directory search by 3 users/hour, at random, using a single key word, and 3 users/hour, at random, using multiple keywords (2 or 3) . Log the times at which the searches are initiated and when the responses are received.	The directory search results are available in 8 seconds or less on an average, for single keyword searches and in 13 seconds or less on an average for multiple keyword searches.		DADS3135#B, IMS-1780#B	
2.003	LDAAC	Conduct a Guide search by 3 users/hour, at random, using keyword. Log the times at which the searches are initiated and when the responses are received.	Guide search results are received in 8 seconds or less, on an average.		DADS3135#B, IMS-1780#B	
2.004	LDAAC	Conduct an inventory search for data from one instrument (MISR, MOPITT) by 5 users/hour, at random, and for data multiple instruments (, MISR, MOPITT) by 5 users. Log the times at which the searches are initiated and when the responses are received. (in some cases select the same data by different users).	Inventory search results are received, on an average by 8 seconds for single instrument and 18 seconds for multiple instruments.		DADS3135#B, IMS-1780#B	
2.005	LDAAC	Browse selected data by 4 users/hour at random . Log the times at which the browse command has been given and the times at which the display of the browse data has started. (In some cases select the same browse data by different users).	The browse data begins display in 58 seconds or less on an average.		DADS3135#B, IMS-1780#B	
2.006	LDAAC	Conduct document search by one user /hour with a key word on documents with about 1000 pages. Log the times at which the search is initiated and when the response is received.	Document search results are available in 3 seconds on an average.	Requirement of 1000 pages arises out of IMS-1780B **Not in Release 2.0, drop 4**	DADS3135#B, IMS-1780#B	
2.007	LDAAC	Log in as multiple users and generate a large number of data product orders (number TBD), for science data available on the ECS archives, for delivery by network The total volume of the orders should be 75 GB (TBD?).	Data supply orders are generated.			
2.008	LDAAC	Request for cost estimates for each of the orders prepared in the above step.	The system responds with the cost estimate within 13 seconds on an average.	**Not in Release 2.0, drop 4**	DADS3135#B, IMS-1780#B	
2.009	LDAAC	Place supply orders for the orders generated in the above steps.	Supply orders are confirmed.			

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.010	LDAAC	Record the time of submission of the data orders. Verify the average time for order confirmation.	The data supply orders are confirmed in 13 seconds, on an average.		DADS3135#B, IMS-1780#B	
2.011	LDAAC	Monitor the progress of the data distribution activity, and record the number of orders and the volume of data successfully delivered electronically once every hour.	Data transfer starts.			
2.012	LDAAC	Every 3 hours determine the rate at which the data are distributed, in the previous 3 hours, six hours, 9 hours and 12 hours, as applicable.	Data delivery rate is as specified , on an average, over a period of 12 hours.		DADS3100#B	
2.013	LDAAC	Log in as multiple users and generate a large number of data product orders (number TBD), for science data available on the ECS archives, for delivery by hard media (tape). The total volume of the orders should be 75 GB (TBD?).	Data supply orders are generated.			
2.014	LDAAC	Request for cost estimates for each of the orders prepared in the above step.	The system responds with the cost estimate within 13 seconds on an average.	**Not in Release 2.0, drop 4**	DADS3135#B, IMS-1780#B	
2.015	LDAAC	Place supply orders for the orders generated in the above steps.	Supply orders are confirmed.			
2.016	LDAAC	Record the time of submission of the data orders. Verify the average time for order confirmation.	The data supply orders are confirmed in 13 seconds, on an average.		DADS3135#B, IMS-1780#B	
2.017	LDAAC	Monitor the progress of data distribution activity, and record the number of orders and the volume of data successfully delivered on hard media, once every hour. (The delivery is considered as complete when the data are recorded on tape and packed and ready for dispatch).	Data delivery starts.			
2.018	LDAAC	Every 3 hours determine the rate at which the data are distributed, in the previous 3 hours, six hours, 9 hours and 12 hours as applicable.	Data delivery rate is as specified, on an average, over a period of 12 hours.		DADS3110#B	

Attachment 2

Test Case Id: V2.0-L-EGS-11-02

Description: This test verifies the capability of LDAAC to:

1. Deliver data archived on tape to the communications network within 5 minutes in response to data requests. The conditions under which the test is required to be conducted are
i) Normal operating load consisting of Ingest, archive, distribution to PGS and media distribution operations taking place in parallel at normal rates,
ii) The maximum of six data requests in the tape (near line) archive to be satisfied simultaneously at LDAAC, where each request represents one tape of 100 MB or less, each of which is located on a separate tape.

2. Deliver the data sets available for rapid retrieval (kept on line), to the communications network, within 60 seconds in response to data requests. The conditions under which this is required to be achieved are:

i) The operator will determine the type of data sets or granules for such a delivery, and the respective time periods during which these data sets/granules will be available for rapid retrieval

ii) The total volume of such predetermined data (25 GB), and the number of 3 data requests of 100Mb or less are to be satisfied at LDAAC

iii) The operator will have the capability to reconfigure the on line storage in order to increase or decrease the total volume at the DAAC stated in condition ii) above.

Objectives: Verify that :
1. The system delivers data archived on tape to the communications network within 5 minutes in response to data requests.
2. The system delivers the data sets available for rapid retrieval to the communications network within 60 seconds in response to data requests.

Configuration: LDAAC will be configured for the daily operational activities based on the science operations plan and the technical baseline. All hardware, software, and PGEs as integrated into the system are operational and the operations are supported by the M&O personnel. The LDAAC is configured to receive MISR, and MOPITT L0 and expedited data from EDOS. LDAAC is configured to receive the ancillary data as required for product generation from the designated sources and MOPITT products from SCF. The DAAC will be configured to operate on the normal daily operational schedule. This test case will run concurrently with test cases 1A and 1B, when the DAAC is operating at normal load, using an additional workstation.

Data Inputs: MISR, MOPITT, Level L0 to L1 test data, or similar data for data access test. The system should have a large number (Say 100) of user profiles in data base including users who will access the system during the test. For purposes of this test,

science data sets (total volume 15 GB), are kept on line for rapid retrieval. The test conditions specified in F&PRS section 7.5.3.4 should be fulfilled.

Verified Requirements: DADS3125#B, DADS3126#B

Test procedures: (To be updated)

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
1.001	LDAAC	Verify that LDAAC is fully operational and is setup to operate in a "day in the DAAC " mode.	LDAAC is operational.			
1.002	LDAAC	Ensure/Verify that the EGS 11 test cases 1A and 1B are running concurrently. (This test case is to be executed in parallel with test cases 1A and 1B).	Test cases 1A and 1B are being executed.			
1.003	LDAAC	Verify that the test data sets / granules needed for rapid retrieval are available on line and its volume is 25 GB.	The test data required for rapid retrieval are available on line.			
2.001	LDAAC	Using a workstation in the DAAC, prepare and submit 6 data requests from the archives (each request is for not more than 100MB of data , and each data ordered is from a single archived tape).	The data supply orders are received by the system.			
2.002	LDAAC	Using the data logs, verify that the requested data is made available to the network within 5 minutes of the order submission.	Data requested from archived tapes are delivered to the communications network in 5 minutes or less.		DADS3125#B	
2.003	LDAAC	Using a workstation in the DAAC, prepare and submit 3 data requests from the on line storage (each request is for not more than 100MB of data).	The data supply orders are received by the system.			
2.004	LDAAC	Using the data logs, verify that the requested data from each of the orders is made available to the network within 60 seconds of the order submission.	Data requested from the online storage is delivered to the communications network in 60 seconds or less.		DADS3126#B	

Attachment X
RBRs with Performance Requirements

Paragraph id	Rele	Text	Req type	Req cat	Req interpretation
DADS1235#B	B0	Each DADS shall temporarily store expedited data received for 48 hours or until production data are available (whichever comes first).	performance | functional	mission essential	At Release A. expedited data will be stored. The mechanism to automatically delete it after 48 hours or when production on data are available will not be available until Release B.
DADS2778#B	B0,B1	Each DADS shall be capable of receiving and archiving three days' worth of data (see Appendix C) in any given day.	performance	mission essential	*The Release B0 archives throughput are calculated based on the capacity to accommodate the Release B0 supported missions until 1 year after AM-1 launch (middle of 99). The archive at GSFC is also sized to support the TSDIS data (along with required ancillary) and V0 migration data while LaRC archive is also sized to support the CERES (TRMM) data (along with required ancillary) and V0 migration data. EDC and NSIDC are also sized to support V0 migrated data. Total throughput capacity from L0 plus non-EOS data and 1.2 days worth of higher level EOS data in 1 day , derived from the Feb., 1996 Technical Baseline (Release B0 procurement baseline) in GB/day is 574 @ GSFC, 295 @ LaRC, 540 @ EDC and 20 @NSIDC. Note The specified TRMM/TSDIS storage volumes are to accommodate possible future data migration*
DADS3100#B	B0, B1	Each DADS shall be capable of transmitting data over communications network in support of data production requests at the data rate specified in Appendix C and in support of data distribution requests at a rate equivalent to daily product volume (L1-L4).	performance	mission essential	*The Release B0 Data Server supports the data production the following network distribution flows, as derived from the L1-L4 volume in the Feb., 1996 Technical Baseline (Release B0 procurement baseline): @GSFC 368 GB/day to users, @ LaRC 146 GB/day to users, @ EDC 88 GB/day to users and @ NSIDC 11 GB/day to users. This includes the distribution of data for instrument calibration and data QA.*
DADS3110#B	B1	Each DADS shall be capable of distributing data via physical media at a rate equivalent to the rate data are ingested at that DADS.	performance	mission essential	
DADS3125#B	B0, B1	Each DADS shall make archive data, stored in a predefined ECS standard format, that has been requested for delivery via communications network, available to the network in the same format in less than 5 minutes after the receipt of a request for that data under conditions stated below. This requirement applies to all data (TRMM, AM, LS-7, etc.) archived by ECS at all DAACs. Conditions for DADS3125: 1) Normal operating load consisting of ingest, archive, query, inter-DAAC data transfer, distribution to PGS, and media distribution operations taking place in parallel at nominal rates. 2) The maximum number of data requests in the tape (near-line) archive distribution queue to be satisfied simultaneously at each DAAC is given below, where each request represents one file of 100MB or less, each of which is located on a separate tape. DAAC Number of requests in Queue GSFC 6 EDC 5 LaRC 6 JPL 4	performance	mission fulfillment	

Paragraph id	Rele	Text	Req type	Req cat	Req interpretation
		NSID 4 3) The total daily distribution volume at each DAAC, as stated in DADS3100 and DADS3110, must also be achieved. *Support for the JPL DAAC and the priority queuing of Electronic Distribution Requests are not provided until B1*			
DADS3126#B	B1	The DADS shall be capable of retrieving and making a limited amount (as stated below) of data available to the communications network for electronic delivery in less than 60 seconds after the receipt of a data request for such data sets or granules under the following conditions: 1) The operator will predetermine the type of data sets or granules for such delivery, and the respective time periods during which these data sets or granules will be available for rapid retrieval (kept on-line). 2) The total volume of such predetermined data, and the number of data requests to be satisfied in parallel at each DAAC are as follows: DAAC Total Volume (GB) # of Requests* GSFC 20 3 EDC 15 3 LaRC 25 3 JPL 15 3 NSIDC 5 3 3) The operator will have the capability to reconfigure the on-line storage in order to increase or decrease the total volume at each DAAC stated in condition (2) above. *Each data request represents one file of 100 MB or less.	performance	mission fulfillment	
DADS3135#B	B1	The DADS shall have the capability to support the transaction rate as specified in Table 7-4.	performance	mission essential	
EOSD1015#B	B0	The DADS at each DAAC that receives instrument level 0 data from EDOS shall provide the capability to ingest and archive the data at a rate that is equivalent to 1.2 times the DAAC average level 0 input rate.	Performance	mission critical	ECS interprets "archive" in this requirement to mean the capture of L0 data from EDOS in safe storage.
EOSD1030#B	B0	ECS shall have the capacity to accept a daily average of two (2) per cent of the daily data throughput as expedited data for use in mission functions of calibration and anomalies.	performance | functional	mission essential	
EOSD1050#B	B0	ECS shall generate and make available to the users Level 1 Standard Products within 24 hours after the availability to ECS of all necessary input data sets.	performance	mission fulfillment	
EOSD1060#B	B1	ECS shall generate and make available to the users Level 2 Standard Products within 24 hours after the availability to ECS of all necessary Level 1 and other input data sets.	performance	mission fulfillment	
EOSD1070#B	B1	ECS shall generate and make available to the users Level 3 Standard Products within 24 hours after the availability to ECS of all necessary Level	performance	mission fulfillment	

Paragraph id	Rele	Text	Req type	Req cat	Req interpretation
		2 and other input data sets.			
EOSD1080#B	B1	ECS shall generate and make available to the users Level 4 Standard Products within one week after the availability to ECS of all necessary Level 3 and other input data sets.	performance	mission fulfillment	
IMS-1780#B	B0, B1	The IMS shall respond to each user session operation within the time period specified in Table 7-4 with the specified rate of IMS operations.	performance	mission essential	
IMS-1785#B	B1	The IMS performance specified in Table 7-4 shall be maintained during other IMS operational activities such as database updates from the DADS.	performance	mission essential	